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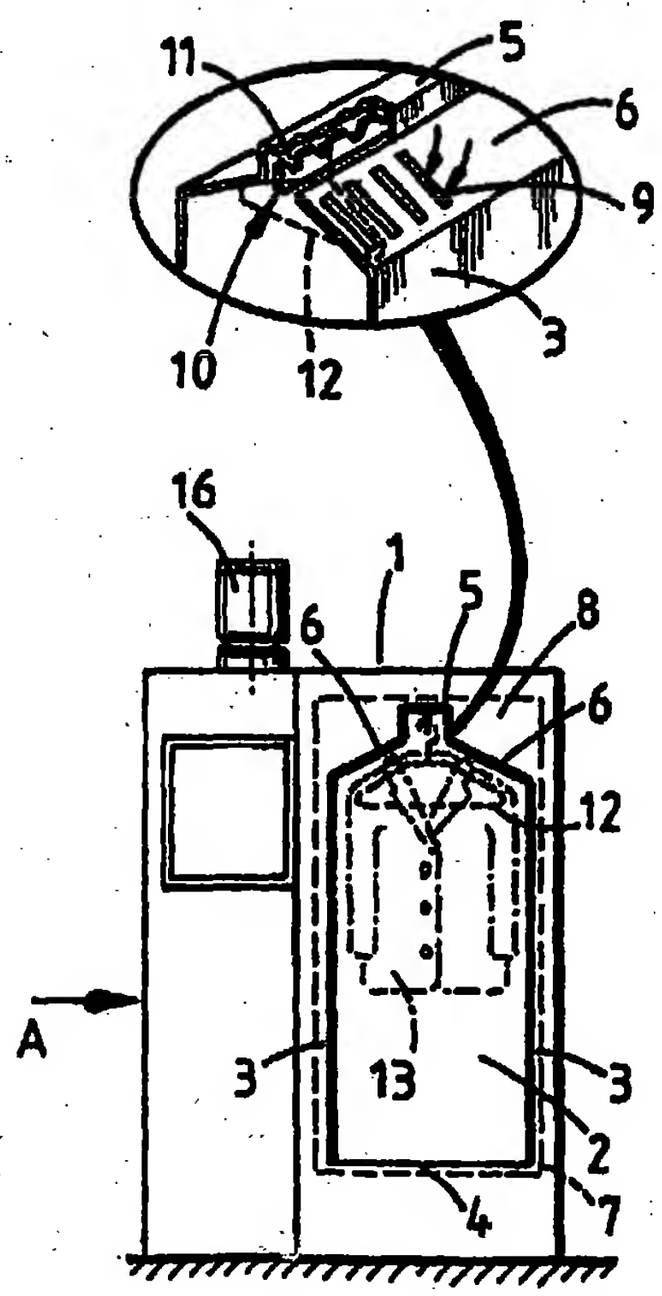
(54) Title: DRYING APPARATUS

(57) Abstract

A drying apparatus (1) comprises a drying enclosure (2), means (10) for supporting a plurality of garments (13) to be dried so as to hang within the drying enclosure, warm air supply means (14, 16) for supplying warm air to the drying enclosure, and means (9) for directing said stream of warm air over front and back surfaces of garments hanging in the enclosure.



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DRYING APPARATUS

The present invention relates to a drying apparatus for drying laundered garments.

According to the present invention there is provided drying apparatus comprising a drying enclosure, means for supporting a plurality of garments to be dried so as to hang within the drying enclosure, warm air supply means for supplying a stream of warm air to the drying enclosure, and means for directing said stream of warm air over front and back surfaces of the or each garment hanging in the enclosure.

The invention provides an efficient drying means by accommodating a plurality of garments to be dried and ensuring that warm air passes over both front and back surfaces of the or each article hanging within the enclosure.

Preferably the enclosure is provided with a door so that the enclosure may be "closed" during a drying operation.

Preferably garment location means are provided for ensuring that garments are hung, in the enclosure, in predetermined static positions. If desired, the position of the garment location means may be adjustable.

In a preferred embodiment of the invention the drying apparatus comprises a compartment which is located above the drying enclosure and which receives warm air from the warm air supply means, said compartment being separated from the drying enclosure by an apertured wall member, wherein said apertures are arranged relative to garment location means such that in use warm air entering the compartment

is directed by the apertures to pass in streams downwardly across front and back surfaces of garments located in predetermined positions by the garment location means.

Preferably the apertures are in the form of slots, neighbouring pairs of slots directing warm air over front and back surfaces of each garment respectively.

The garment support means may comprise a rail from which garments may be hung from suitable hangers. Such hangers may be conventional clothes hangers or hangers designed to open the garment out slightly so that warm air may pass into the inside of the garment. The rail may be slidable into and out of the enclosure whereby the hangers may easily be positioned on, and removed from, the rail when it is extended from the cabinet. The garment positioning means may comprise notches or apertures provided in the rail and in which the hangers may be located.

Preferably the drying apparatus further comprises air extraction means, e.g. an extraction fan, for extracting air from a lower region of the enclosure beneath garments to be dried.

The warm air supply means may comprise any suitable means, for instance a fan and a heater such as an oil or gas burner.

The present invention will now be further described, by way of example only, with reference to the accompanying drawings, in which

Figure 1 is a schematic front view of a drying apparatus according to the present invention;

Figure 2 shows the drying apparatus of Figure 1 looking in the direction of arrow A in Figure 1;

Figure 3 shows the drying apparatus of Figure 1 looking in the direction of arrow B in Figure 2;

Figure 4 illustrates a garment support rail assembly which may be used in the apparatus of Figure 1;

Figure 5 illustrate a modification for the upper area of the drying enclosure of the apparatus shown in Figure 1;

Figure 6 illustrates the provision of air deflectors in the drying apparatus, and

Figure 7 illustrates a coathanger assembly.

The illustrated drying apparatus 1 comprises a housing in which is provided a drying enclosure 2 the outline of which is defined by side walls 3, a base 4, and an upper region defined by an inverted U-shaped member 5 and ceiling panels 6 which extend downwardly away from the U-shaped member. Access to the enclosure 2 is by means of a door 7 (shown by dashed lines in Fig. 1).

Defined above the panels 6 and around the exterior of member 5 is a compartment 8 into which warm air is supplied in the manner to be described. Each of the ceiling panels 6 is provided over its length with a plurality of transverse parallel slots 9 through which air may be supplied from compartment 8 to effect a drying operation (see below).

Supported within the inverted U-shaped member 5 is a rail assembly 10 formed with longitudinally spaced notches 11 for supporting clothes hangers 12 in

predetermined spaced apart relationship and therefore enable garments 13 to be hung accurately at predetermined positions within the drying enclosure 2. Rail assembly 10 is telescopic whereby it may be extended from the enclosure 2 when door 7 is open to facilitate loading and unloading of the enclosure 2.

It should be noted that the illustrated coathangers 12 are of conventional width and that the drying enclosure is of slightly greater width.

As illustrated in Fig. 1, the slots 9 in any one panel 6 are provided in pairs each of which is located at positions corresponding to the location of notches 11.

Warm air for the apparatus is provided by a gas burner 14 mounted on a wall of a vertical tunnel 15. At the top of the tunnel 15 there is mounted a fan 16 for supplying warm air into the compartment 8 above the panels 6. Thus warm air generated by the burner 14 rises in the tunnel 15 and is blown into compartment 8 by the fan 16. For ease of installation, the tunnel 15 and the housing of the drying enclosure may be constructed as separate modules.

An extraction fan 17 is provided towards the bottom of tunnel 15 to extract warm air from the drying enclosure from beneath the garments being dried. The recovered heat may be used in connection with other laundering operations with which the illustrated dryer may be associated.

It should be noted that the positioning of the slots 9 is such that warm air blown into the compartment 8 by the fan 16 is directed onto both sides of each garment hung in the enclosure. In other words, streams of warm air are blown downwardly across both the front and back of each garment to be dried thereby

enhancing the efficiency of the drying operation. This is achieved by virtue of the slots 9 in any one panel 6 being provided in pairs at positions corresponding to the location of the notches.

It will therefore be appreciated that, in use of the apparatus, the drying enclosure is initially loaded with garments to be dried. Once the door 7 has been closed, burner 14 and fan 16 may be operated to supply warm air downwardly through the slots 9 so as to effect drying. Since, as shown in Fig. 1, the panels 6 are positioned closely above the "shoulder" regions of the coathangers, the air from slots 9 is directed immediately onto the garments. The length of time for which burner 14 and fan 16 are operated may be controlled by a suitable timing control system (not shown).

As mentioned above, the rail assembly 10 is telescopic so as to be extendible out of the drying enclosure 2. One example of such an assembly is shown in Fig. 4 and comprises a garment support rail 18 (in which the aforementioned notches are provided) mounted by means of the support arrangement described below on a bracket 19 which is itself mounted on the U-shaped member 5. The rail 18 is supported on bracket 19 by an arrangement of two slide members 20 and 21 and a strut 22. More particularly, slide member 20 is mounted on bracket 19 by a sliding bearing 23 whereas slide member 21 is mounted on slide member 20 by a further sliding bearing 24.

It will thus be appreciated that movement of both slide members 20 and 21 to their limit positions in a direction outwardly of the enclosure provides for full movement of rail 18 out of enclosure 2.

Reference is now made to Fig. 5 which illustrates a modification for the ceiling area of the drying enclosure. In this modification, the limbs of the U-shaped member 5 are provided with longitudinally extending slots 25. The inner edges of these slots are provided with deflectors 26 for directing air which has passed through the slots (inwardly of the U-shaped member 5) downwardly into the enclosure 2. Furthermore, the lower edges of the limbs of the U-shaped member 5 are provided with deflectors 27 extending downwardly towards each other. It should also be noted that slots 9 are provided with cascades 28 which extend along the longitudinal edges of slots 9 on the face of ceiling panels 6 which form an interior surface of enclosure 2.

The provision of the slots 25, and deflectors 26 and 27 ensure that warm air from compartment 8 is able to be directed onto and over the central region of a garment supported on the rail assembly. Furthermore the cascades 28 improve the flow of the air through slots 9 onto the garment.

The air flow into the enclosure 2 may also be improved by the provision of various fixed flow deflectors in compartment 8 and examples of such deflectors are shown in Fig. 6 and referenced with numerals 29 to 34. If desired, the upper surfaces of the fixed flow deflectors may (where appropriate) be provided with vanes to distribute the air flow (from fan 16) along the length of the chamber.

In order to reduce the time required to dry garments, it is desirable that the garments be held in a slightly open condition so that warm air may pass easily onto the interior surfaces of the garments to effect drying of the garment interior. It is thus desirable the coathanger on which the garments are supported is capable of holding the front and rear of the garment slightly apart. A coathanger which will achieve this purpose is illustrated in Fig. 7 and comprises a main coathanger portion 35 (or which a garment such as a coat, jacket, pullover, etc.) may be supported in conventional manner, and a garment separator portion 36 which serves to separate the front and rear of the garment. The coathanger is a one piece plastics article and the coathanger portion 35 and garment separator portion 36 are connected together by an integral bridging member 37.

CLAIMS

1. A drying apparatus comprising a drying enclosure, means for supporting a plurality of garments to be dried so as to hang within the drying enclosure, warm air supply means for supplying warm air to the drying enclosure, and means for directing said stream of warm air over front and back surfaces of garments hanging in the enclosure.

2. Apparatus as claimed in claim 1 provided with garment location means for ensuring that garments are hung is predetermined static positions within the enclosure.

3. Apparatus as claimed in claim 2 wherein the position of the garment location means is adjustable.

4. Apparatus as claimed in claim 2 or 3 wherein the support means comprises a rail assembly including a rail from which garments may be hung by means of hangers and the garment location means are provided in the rail.

5. Apparatus as claimed in claim 4 wherein the garment positioning means are provided in or on the rail.

6. Apparatus as claimed in claim 5 wherein the garment positioning means comprise notches or apertures which are provided in the rail and in which the hangers may be located.

7. Apparatus as claimed in any one of claims 4 to 6 wherein the rail assembly is telescopically extendible out of the drying enclosure.

8. Apparatus as claimed in any one of claims 1 to 7 comprising a compartment which is located above the drying enclosure and which receives warm air from the warm air supply means, said compartment being separated from the drying enclosure by at least one apertured wall member wherein the apertures are arranged relative to the garment location means such that in use warm air entering the compartment is directed by the apertures to pass across front and back surfaces of garments located by the positioning means.

9. Apparatus as claimed in claim 8 wherein two of said apertured wall members are provided, said wall members forming ceiling panels which extend transversely from opposed side walls of the enclosure upwardly towards each other.

10. Apparatus as claimed in claim 9 wherein the apertures are slots extending transversely of the panels.

11. Apparatus as claimed in claim 9 or 10 wherein an inverted channel member is provided between adjacent longitudinal edges of the ceiling panels and the garment support means is provided within said inverted channel member.

12. Apparatus as claimed in claim 11 wherein slots are provided in the sides of the channel member whereby air from the compartment may pass through the walls of the channel member.

13. Apparatus as claimed in any one of claims 1 to 12 wherein the warm air supply means is a gas burner or oil burner.

14. Apparatus as claimed in any one of claims 1 to 13 wherein the enclosure is provided with a door so as to close the enclosure during a drying operation.

15. Apparatus as claimed in any one of claims 1 to 14 wherein air extraction means are provided for extracting air from a lower region of the drying enclosure from beneath garments being dried.

16. The combination of drying apparatus as claimed in any one of claims 1 to 15 and coathangers which are adapted to open a garment slightly so that warm air may pass into the inside of the garment.

17. The combination as claimed in claim 16 wherein the coathangers each comprise a main coathanger portion and a garment separator portion spaced therefrom.

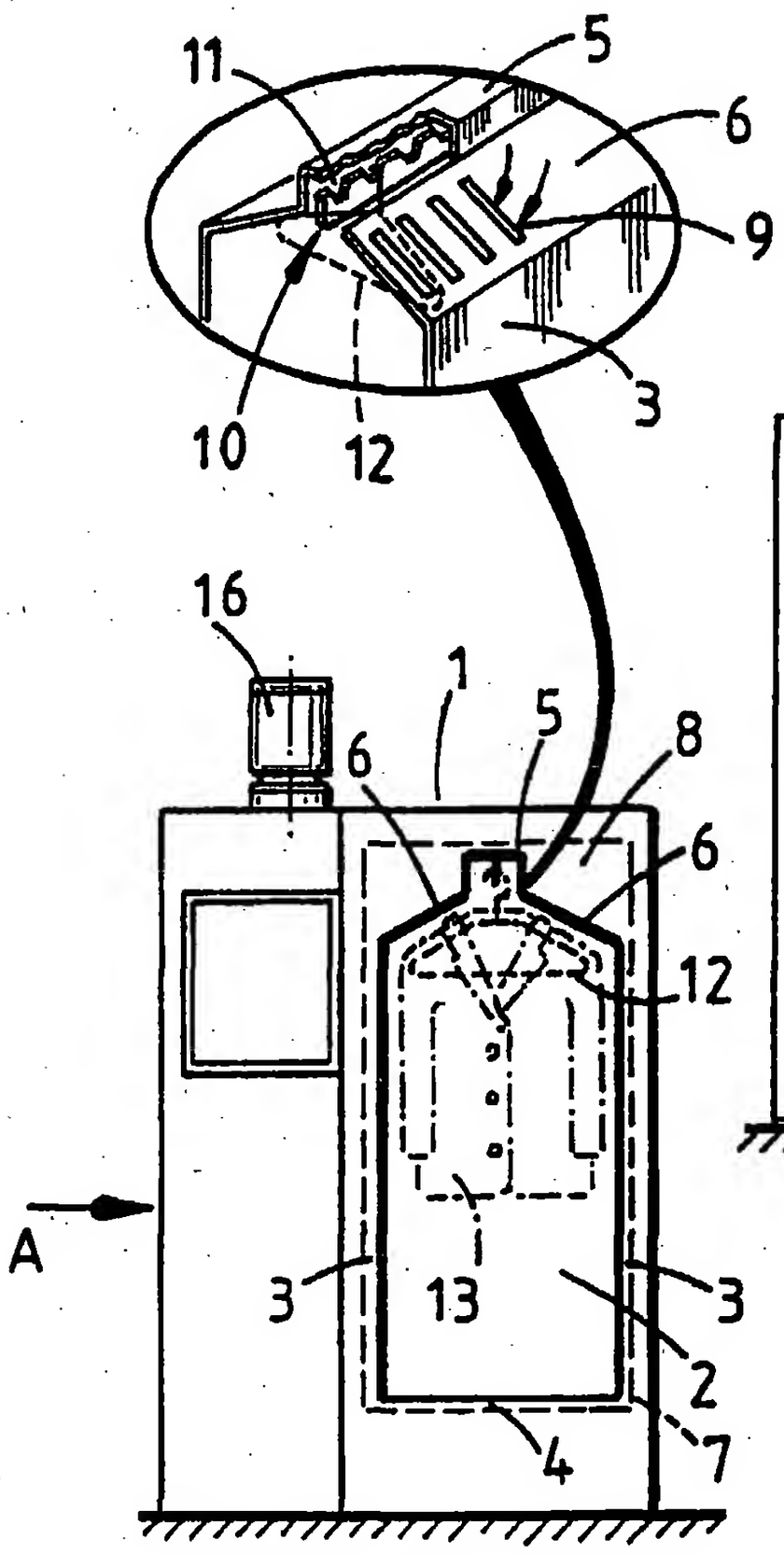

FIG.1

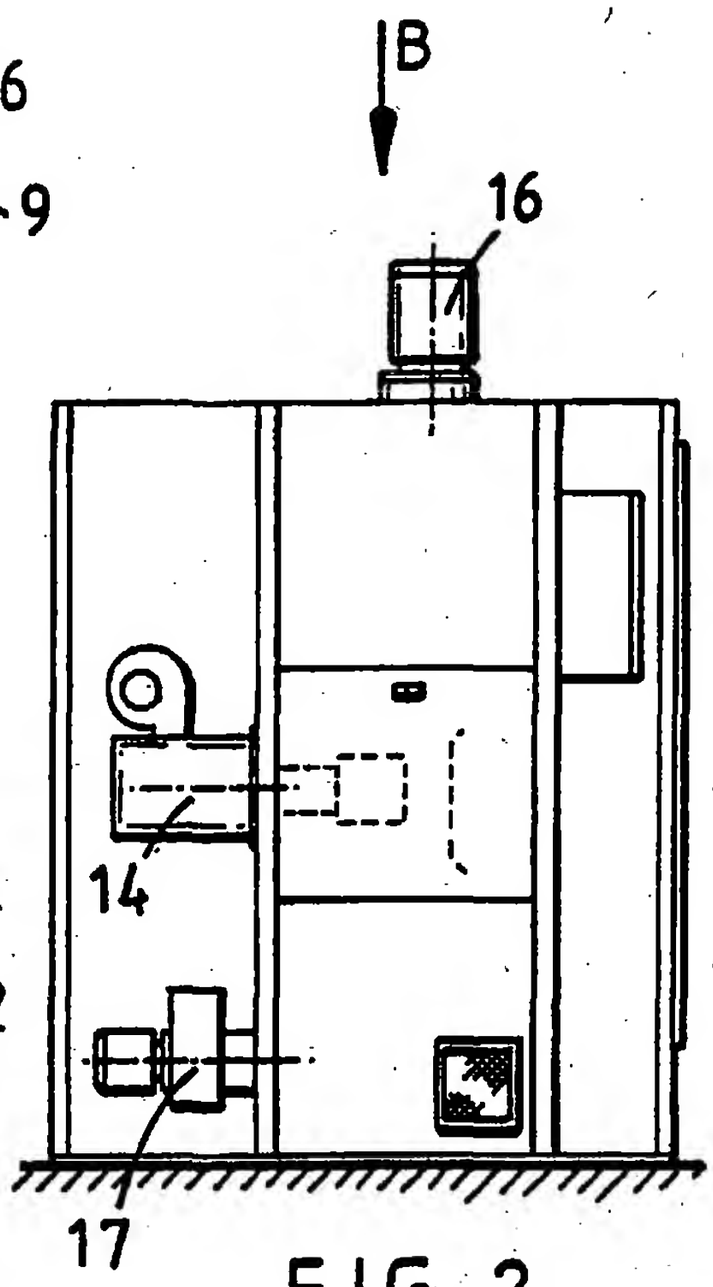

FIG.2

FIG.3

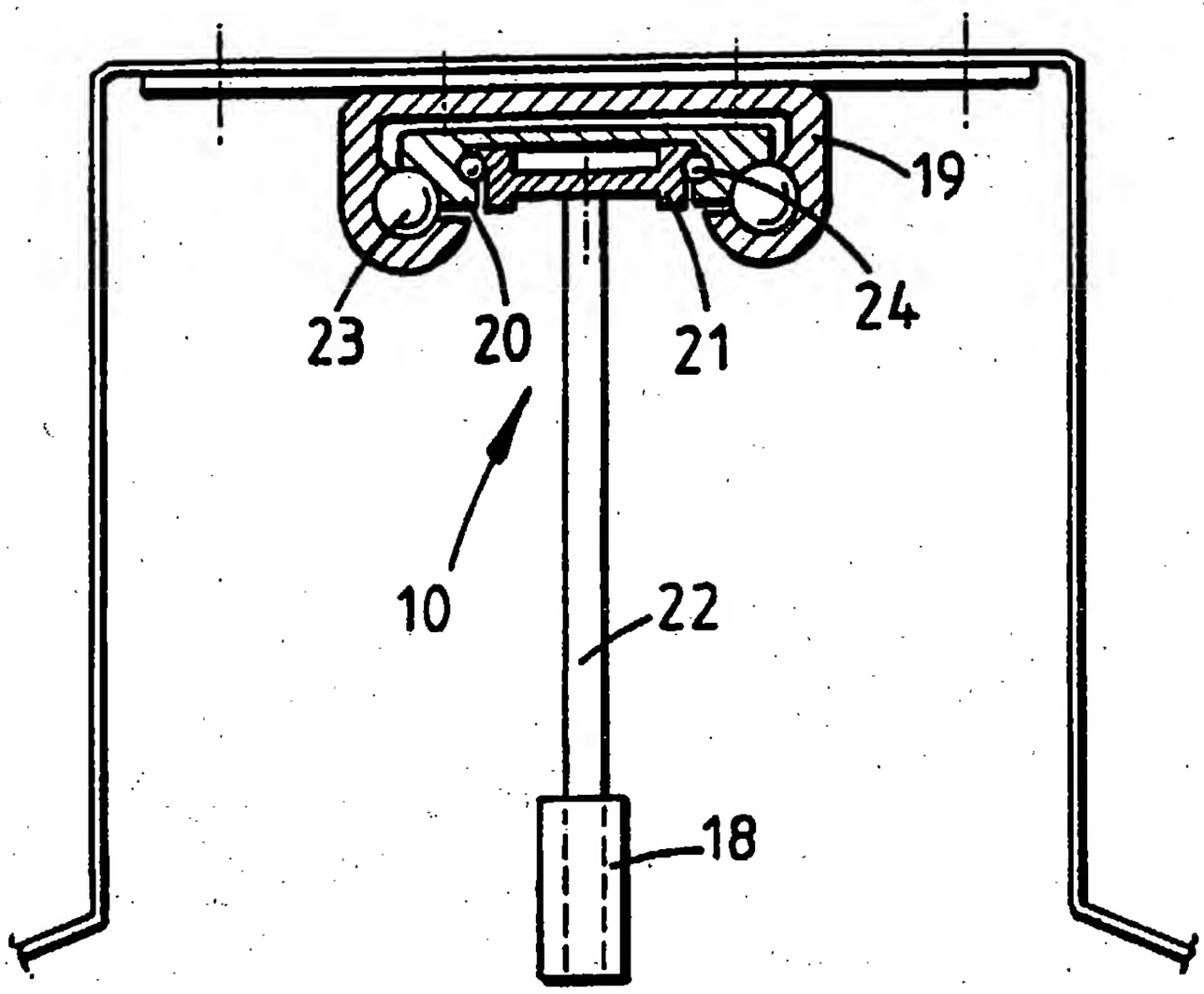

FIG.4

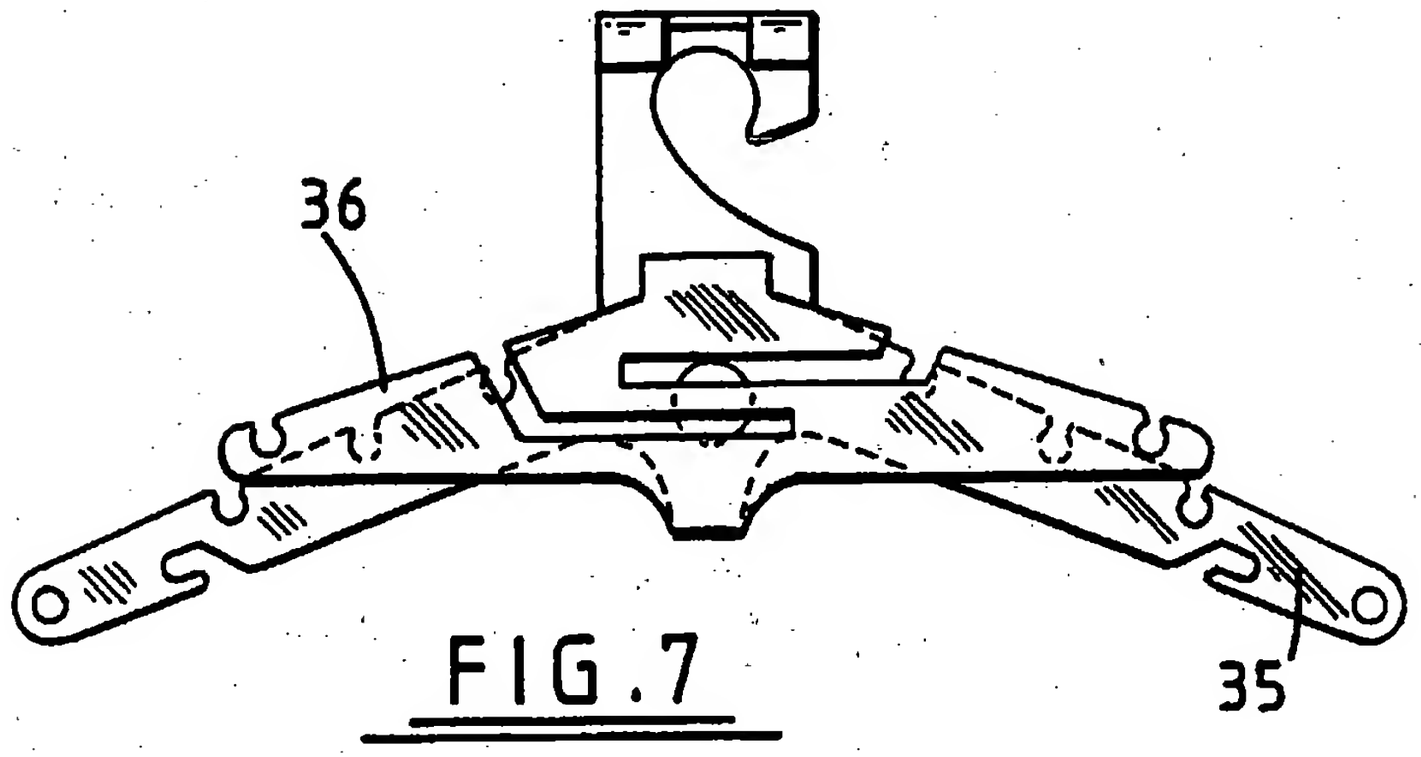

FIG.7

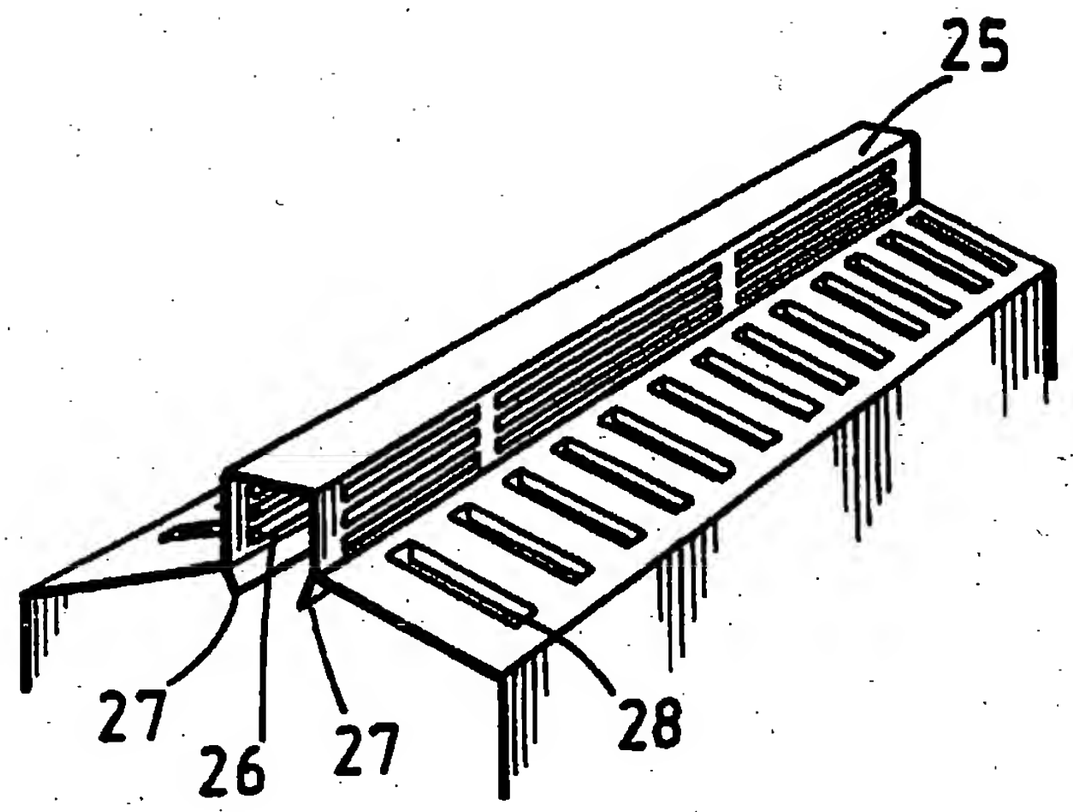

FIG.5

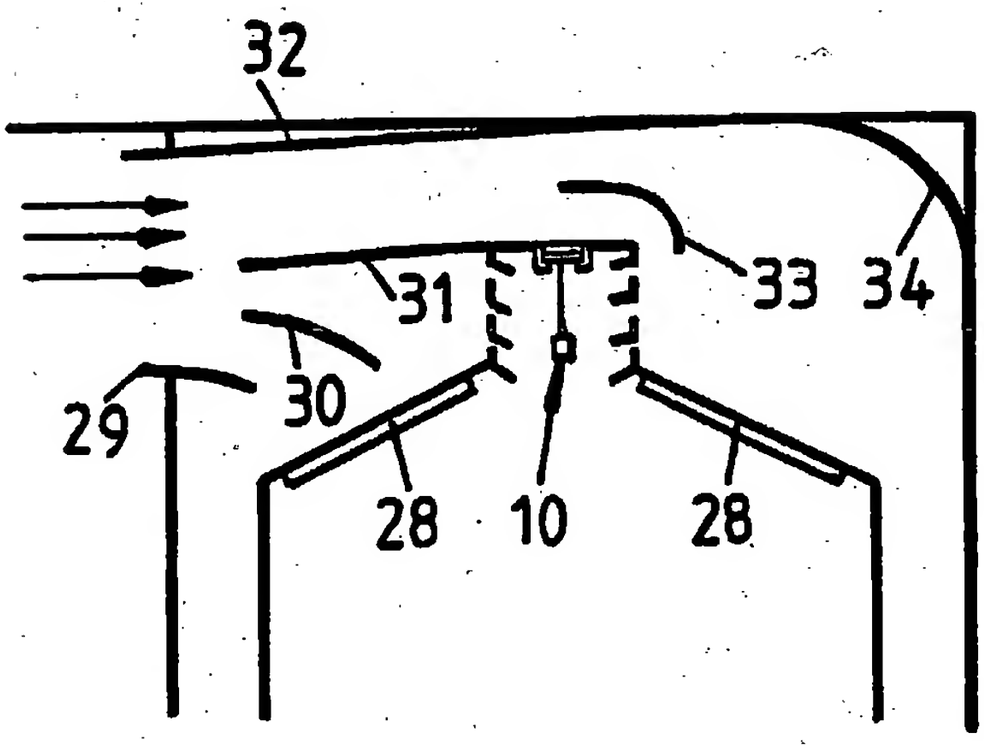

FIG.6

INTERNATIONAL SEARCH REPORT

Inter nal Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 D06F58/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,3 257 739 (PROCTOR & SCHARTZ INC) 28 June 1966	1,2,4-7, 14,16,17
A	see the whole document	8-10,15

X	US,A,3 352 627 (ATLAS COVERALL & UNIFORM SUPPLY CO.) 14 November 1967	1,2, 4-12,15
A	see the whole document	14

X	GB,A,1 018 259 (E.I. DU PONT DE NEMOURS AND COMPANY) 26 January 1966	1,2,4,6, 7
A	see the whole document	8-10

X	DE,A,16 35 414 (O. VIERTEL & H. SCHMIDT) 1 April 1971	1,2,14
A	see claims; figure	4,5,7,8, 15,16

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[X] Further documents are listed in the continuation of box C.

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US-A-3352627	14-11-67	NONE	
GB-A-1018259		NONE	
DE-A-1635414	01-04-71	NONE	
GB-A-1316756	16-05-73	NONE	
GB-A-1209405	21-10-70	NONE	